VMmark® 3.1.1 Results

Server Vendor & Model: HPE Superdome Flex 280 **Storage Vendor & Model: SanDisk ION Accelerator** **Hypervisor: VMware ESXi 7.0 U2a, Build 17867351** **Datacenter Management Software: VMware vCenter Server 7.0 U2, Build 17694817**	**VMmark 3.1.1 Score = 20.03 @ 20 Tiles**

Number of Hosts: 2	**Uniform Hosts [yes/no]: yes**	**Total sockets/cores/threads in test: 8/224/448**
Tested By: Hewlett Packard Enterprise		**Test Date: 11-15-2021**

Performance Section	**Configuration Section**	**Notes Section**
Performance	Configuration	Notes for Workload

Performance

	weathervane			**weathervaneE**			**dvdstoreA**			**dvdstoreB**			**dvdstoreC**			
TILE_0	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3569.38	0.99	0.73 | 0.00	567.87	0.99	0.63 | 0.31	1009.92	1.38	638.35	713.05	1.42	763.27	492.88	1.42	875.33	1.22
p1	3558.02	0.99	0.70 | 0.01	565.03	0.99	0.61 | 0.26	1002.98	1.37	649.93	745.45	1.49	746.74	521.95	1.51	850.87	1.24
p2	3539.81	0.98	0.70 | 0.00	561.81	0.98	0.41 | 0.11	1020.45	1.39	619.62	697.75	1.39	739.31	502.20	1.45	833.67	1.22
TILE_1	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3574.84	0.99	0.54 | 0.00	562.44	0.98	0.41 | 0.17	999.17	1.36	661.04	703.48	1.41	774.49	495.52	1.43	870.70	1.22
p1	3551.73	0.99	0.58 | 0.00	559.11	0.98	0.55 | 0.18	1004.52	1.37	658.60	726.20	1.45	788.53	511.55	1.48	886.13	1.23
p2	3542.95	0.98	0.58 | 0.00	554.79	0.97	0.52 | 0.21	1006.95	1.37	640.45	690.45	1.38	763.77	492.77	1.42	873.39	1.21
TILE_2	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3564.03	0.99	0.78 | 0.00	564.09	0.99	0.60 | 0.22	1032.55	1.41	584.78	770.75	1.54	661.56	542.05	1.56	754.68	1.27
p1	3545.34	0.99	0.68 | 0.00	560.92	0.98	0.44 | 0.09	1048.30	1.43	546.70	750.10	1.50	646.92	555.17	1.60	711.10	1.27
p2	3532.07	0.98	0.71 | 0.00	557.11	0.97	0.52 | 0.12	1042.22	1.42	559.47	755.15	1.51	637.70	525.20	1.51	722.11	1.25
TILE_3	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3567.25	0.99	0.62 | 0.00	563.38	0.98	0.45 | 0.09	1012.70	1.38	634.14	743.33	1.49	743.05	544.42	1.57	839.33	1.26
p1	3551.55	0.99	0.63 | 0.00	559.54	0.98	0.46 | 0.12	1017.20	1.39	626.87	719.80	1.44	737.58	499.12	1.44	836.45	1.23
p2	3541.31	0.98	0.62 | 0.00	552.28	0.97	0.49 | 0.20	1006.12	1.37	654.67	737.02	1.47	752.26	518.80	1.50	854.28	1.23
TILE_4	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3575.51	0.99	0.78 | 0.01	571.21	1.00	0.89 | 0.35	1040.92	1.42	569.88	741.67	1.48	666.33	546.50	1.58	745.67	1.27
p1	3562.26	0.99	0.68 | 0.00	568.66	0.99	0.58 | 0.18	1034.75	1.41	579.06	742.62	1.48	670.09	520.45	1.50	752.44	1.25
p2	3548.73	0.99	0.71 | 0.00	563.25	0.98	0.55 | 0.14	1031.38	1.40	581.69	765.23	1.53	672.67	569.55	1.64	748.19	1.28
TILE_5	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3573.13	0.99	0.65 | 0.00	567.62	0.99	0.87 | 0.33	1019.62	1.39	622.58	718.35	1.44	742.61	499.05	1.44	849.86	1.23

p1	3563.20	0.99	0.63 | 0.00	563.48	0.98	0.62 | 0.12	1005.05	1.37	650.20	734.17	1.47	758.27	516.77	1.49	866.05	1.24
p2	3552.44	0.99	0.62 | 0.00	558.71	0.98	0.69 | 0.21	1020.67	1.39	616.52	718.80	1.44	738.63	522.73	1.51	839.43	1.24
TILE_6	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3572.64	0.99	0.54 | 0.00	565.97	0.99	0.56 | 0.23	1009.92	1.38	644.12	714.25	1.43	750.43	498.18	1.44	846.10	1.23
p1	3553.56	0.99	0.54 | 0.00	564.46	0.99	0.49 | 0.19	1012.08	1.38	639.40	737.85	1.47	745.31	547.90	1.58	834.05	1.26
p2	3548.91	0.99	0.55 | 0.00	561.64	0.98	0.37 | 0.08	1019.38	1.39	622.58	717.08	1.43	736.69	477.82	1.38	829.17	1.22
TILE_7	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3573.33	0.99	0.48 | 0.00	563.87	0.99	0.79 | 0.35	1002.60	1.37	654.19	741.08	1.48	741.07	521.80	1.50	841.83	1.24
p1	3562.33	0.99	0.51 | 0.00	558.84	0.98	0.63 | 0.09	998.02	1.36	674.13	699.15	1.40	804.53	507.82	1.46	900.38	1.22
p2	3551.19	0.99	0.50 | 0.00	558.37	0.98	0.82 | 0.29	995.88	1.36	692.32	698.27	1.40	807.38	482.73	1.39	924.90	1.20
TILE_8	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3571.68	0.99	0.76 | 0.00	570.08	1.00	0.67 | 0.25	1010.73	1.38	640.16	746.00	1.49	736.44	547.90	1.58	830.51	1.26
p1	3553.15	0.99	0.70 | 0.00	565.00	0.99	0.54 | 0.18	1021.67	1.39	618.22	724.70	1.45	719.94	507.68	1.46	822.82	1.24
p2	3537.96	0.98	0.69 | 0.00	559.55	0.98	0.51 | 0.14	1011.08	1.38	640.05	747.00	1.49	733.94	529.33	1.53	832.59	1.25
TILE_9	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3571.36	0.99	0.56 | 0.00	569.33	1.00	0.81 | 0.51	1013.35	1.38	628.92	719.55	1.44	731.78	529.02	1.53	817.21	1.24
p1	3543.66	0.98	0.58 | 0.00	561.25	0.98	0.51 | 0.21	1014.33	1.38	634.28	722.70	1.44	720.86	504.73	1.46	823.55	1.23
p2	3529.64	0.98	0.56 | 0.01	559.79	0.98	0.58 | 0.24	1013.20	1.38	627.80	748.70	1.50	722.42	553.42	1.60	806.56	1.26
TILE_10	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3569.16	0.99	0.49 | 0.00	565.83	0.99	0.59 | 0.29	1053.30	1.43	544.15	757.58	1.51	629.14	526.02	1.52	716.38	1.26
p1	3557.51	0.99	0.48 | 0.00	564.84	0.99	0.51 | 0.17	1044.50	1.42	569.37	774.45	1.55	641.13	548.67	1.58	728.06	1.28
p2	3542.65	0.98	0.50 | 0.00	563.26	0.98	0.42 | 0.11	1045.45	1.42	558.69	748.10	1.49	649.16	550.45	1.59	736.67	1.27
TILE_11	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3568.82	0.99	0.50 | 0.00	567.53	0.99	0.60 | 0.26	1012.40	1.38	633.12	716.33	1.43	749.41	500.80	1.44	831.20	1.23
p1	3558.84	0.99	0.55 | 0.00	562.40	0.98	0.45 | 0.20	984.55	1.34	683.93	720.10	1.44	809.74	534.17	1.54	897.22	1.24
p2	3550.34	0.99	0.55 | 0.00	562.68	0.98	0.51 | 0.09	1003.50	1.37	652.03	706.23	1.41	772.45	491.00	1.42	871.01	1.22
TILE_12	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3572.93	0.99	0.54 | 0.00	568.77	0.99	0.83 | 0.28	1021.77	1.39	614.42	753.95	1.51	703.67	529.27	1.53	803.08	1.26
p1	3562.22	0.99	0.56 | 0.00	562.05	0.98	0.47 | 0.13	1028.08	1.40	608.16	725.20	1.45	723.28	527.98	1.52	825.67	1.25
p2	3547.98	0.99	0.56 | 0.00	562.97	0.98	0.58 | 0.16	1028.00	1.40	602.40	731.00	1.46	708.56	503.40	1.45	817.58	1.24
TILE_13	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3578.66	0.99	0.65 | 0.00	566.55	0.99	0.78 | 0.38	1026.15	1.40	602.12	760.98	1.52	685.94	563.27	1.62	772.16	1.28
p1	3561.42	0.99	0.61 | 0.00	563.86	0.99	0.86 | 0.47	1030.85	1.40	589.11	734.52	1.47	683.93	514.38	1.48	789.05	1.24
p2	3549.08	0.99	0.61 | 0.00	557.74	0.97	0.49 | 0.10	1021.00	1.39	613.41	753.62	1.51	703.87	530.75	1.53	803.18	1.25
TILE_14	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3566.75	0.99	0.51 | 0.00	568.46	0.99	0.74 | 0.23	1018.60	1.39	633.40	719.38	1.44	742.23	523.08	1.51	847.01	1.24

p1	3545.90	0.99	0.50 | 0.00	561.79	0.98	0.55 | 0.11	1017.73	1.39	621.57	722.10	1.44	724.26	499.75	1.44	841.39	1.23
p2	3537.64	0.98	0.50 | 0.00	559.96	0.98	0.44 | 0.10	1010.75	1.38	641.44	743.58	1.49	740.21	545.88	1.57	840.52	1.25
TILE_15	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3573.12	0.99	1.07 | 0.01	565.61	0.99	0.43 | 0.12	1003.52	1.37	657.79	679.45	1.36	792.02	489.10	1.41	890.84	1.21
p1	3565.39	0.99	0.92 | 0.00	557.29	0.97	0.51 | 0.21	998.85	1.36	668.49	730.48	1.46	777.73	514.77	1.48	881.86	1.23
p2	3542.18	0.98	0.94 | 0.00	552.23	0.97	0.47 | 0.09	1009.73	1.38	648.97	711.20	1.42	765.38	518.67	1.50	850.78	1.23
TILE_16	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3577.06	0.99	0.53 | 0.00	564.91	0.99	0.42 | 0.11	1055.92	1.44	545.58	750.77	1.50	639.53	526.30	1.52	725.84	1.26
p1	3562.06	0.99	0.54 | 0.00	566.96	0.99	0.38 | 0.03	1036.40	1.41	578.36	768.67	1.54	668.38	567.85	1.64	743.89	1.28
p2	3541.47	0.98	0.54 | 0.00	562.07	0.98	0.49 | 0.21	1045.20	1.42	560.35	746.38	1.49	655.62	519.60	1.50	750.89	1.25
TILE_17	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3570.50	0.99	0.43 | 0.00	563.93	0.99	0.76 | 0.22	1017.00	1.38	631.40	743.42	1.49	736.34	523.60	1.51	847.61	1.25
p1	3555.49	0.99	0.43 | 0.00	560.36	0.98	0.71 | 0.25	1020.45	1.39	620.38	722.65	1.44	727.69	527.27	1.52	825.63	1.24
p2	3536.67	0.98	0.46 | 0.00	553.91	0.97	0.63 | 0.14	1019.88	1.39	622.43	723.05	1.44	730.27	500.93	1.44	845.27	1.22
TILE_18	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3577.17	0.99	0.45 | 0.00	570.85	1.00	0.68 | 0.36	1019.48	1.39	629.58	770.75	1.54	725.19	549.30	1.58	832.00	1.27
p1	3558.99	0.99	0.46 | 0.00	560.58	0.98	0.58 | 0.21	1024.53	1.40	611.08	696.10	1.39	735.96	499.18	1.44	837.67	1.22
p2	3546.46	0.99	0.45 | 0.00	555.00	0.97	0.45 | 0.08	1016.62	1.38	624.07	748.10	1.49	728.65	525.10	1.51	832.55	1.25
TILE_19	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(nRT|MaxPctF)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	Actual	Ratio	QoS(ms)	GM
p0	3574.25	0.99	0.60 | 0.00	564.58	0.99	0.70 | 0.14	920.02	1.25	876.98	653.85	1.31	1049.77	452.80	1.31	1198.38	1.16
p1	3552.45	0.99	0.58 | 0.00	561.76	0.98	0.51 | 0.15	950.02	1.29	802.82	630.48	1.26	966.96	445.35	1.28	1116.44	1.15
p2	3534.89	0.98	0.59 | 0.00	558.70	0.98	0.53 | 0.11	930.33	1.27	842.90	670.45	1.34	978.93	487.27	1.41	1121.12	1.18

p0_score:	24.87
p1_score:	24.76
p2_score:	24.71

Infrastructure_Operations_Scores:	vMotion	SVMotion	XVMotion	Deploy
Completed_Ops_PerHour	28.00	26.00	20.00	6.50
Avg_Seconds_To_Complete	6.77	88.09	118.38	531.84
Failures	0.00	0.00	0.00	0.00
Ratio	1.08	1.44	1.11	0.81
Number_Of_Threads	1	1	1	1

Summary	Run_Is_Compliant	Turbo_Setting:0
	Number_Of_Compliance_Issues(0)*	Median_Phase(p1)
Unreviewed_VMmark3_Applications_Score	24.76	
Unreviewed_VMmark3_Infrastructure_Score	1.09	

Unreviewed_VMmark3_Score	20.03

Configuration

Virtualization Software	
Hypervisor Vendor, Product, Version, and Build / Availability Date (MM-DD-YYYY)	VMware ESXi 7.0 U2a, Build 17867351 / 04-29-2021
Datacenter Management Software Vendor, Product, Version, and Build / Availability Date (MM-DD-YYYY)	VMware vCetner Server 7.0 U2, Build 17694817 / 03-09-2021
Supplemental Software	None
Servers	
Number of Servers in System Under Test (all subsequent fields in this section are per server)	2
Server Manufacturer and Model	HPE Superdome Flex 280
Processor Vendor and Model	Intel Xeon Platinum 8380H
Processor Speed (GHz) / Turbo Boost Speed (GHz)	2.9 / 4.3
Total Sockets/Total Cores/Total Threads	4 Sockets / 112 Cores / 224 Threads
Primary CPU Cache	32 KB I + 32 KB D on chip per core
Secondary CPU Cache	1 MB I+D on chip per core
Other CPU Cache	38.5 MB I+D on chip per chip
BIOS Version	Bundle:1.10.272 SFW:008.010.081.000.2104290505
Memory Size (in GB, Number of DIMMs)	3072, 24
Memory Type and Speed	128 GB 4DRx4 PC4-3200 LRDIMMs
Disk Subsystem Type	FC SAN
Number of Disk Controllers	1
Disk Controller Vendors and Models	Intel C699/X79 SATA RAID Controller
Total Number of Physical Disks for Hypervisor	1

Disk Vendors, Models, Capacities, and Speeds	HPE 1 TB SATA 6G 7.2K HDD
Number of Host Bus Adapters	2
Host Bus Adapter Vendors and Models	2 x HPE SN1610Q 32Gb dual port FC HBA
Number of Network Controllers	3
Network Controller Vendors and Models	1 x Intel Ethernet I210-T1 GbE NIC Adapter 2 x HPE Ethernet 10Gb 2-port SFP+ X710-DA2 Adapter
Other Hardware	None
Other Software	None
Hardware Availability Date (MM-DD-YYYY)	06-01-2021
BIOS Availability Date (MM-DD-YYYY)	06-01-2021
Software Availability Date (MM-DD-YYYY)	05-28-2021
Network	
Network Switch Vendors and Models	HPE FlexFabric 5940 48SFP 6QSFP Switch
Network Speed	Management: 1 Gb/s vMotion and VMs: 4 x 10 Gb/s
Primary Storage	
Storage Category	SCSI Target
Storage Vendors, Models, and Firmware Versions	SanDisk ION Data Accelerator 2.5.5
Storage Configuration Summary	FC SAN Switches: • 1 x HPE SN6000B 16 Gb 48 port FC switch Storage Servers: • 5 x HPE DL380 Gen9 servers running SanDisk ION Data Accelerator 2.5.5 ◦ OS: 2 x 450 GB 12G SAS SFF HDD ◦ Storage for exported LUNs: 3 x HPE 2.6 TB HH/HL Light endurance (LE) PCIe Workload Accelerator flash cards
Datacenter Management Server	
System Model	HPE ProLiant DL380 Gen10
Processor Vendor and Model	Intel Xeon Gold 6238
Processor Speed (GHz)	2.1
Total Sockets/Total Cores/Total Threads	2 Sockets / 44 Cores / 88 Threads

Memory Size (in GB, Number of DIMMs)	192, 12
Network Controller(s) Vendors and Models	HPE Ethernet 1Gb 4-port 331i Adapter
Operating System, Version, Bitness, and Service Pack	VMware ESXi 7.0 U2a, Build 17867351
Virtual Center VM Number of vCPUs	8
Virtual Center VM Virtual Memory (in GB)	28
Virtual Center VM Operating System, Version, Bitness, and Service Pack	VMware vCenter Server 7.0 U2, Build 17694817
Other Hardware	None
Other Software	None

Clients

Total Number of Virtual Clients / Virtual Client Hosts	21 / 2
System Model(s)	HPE ProLiant DL580 Gen10
Processor Vendor(s) and Model(s)	Intel Xeon Platinum 8280L
Processor Speed(s) (GHz)	2.7
Total Sockets/Total Cores/Total Threads	4 Sockets / 112 Cores / 224 Threads
Memory per Virtual Client Host	768 GB
Network Controller(s) Vendors and Models	1 x HPE Ethernet 1Gb 4-port 331FLR Adapter 2 x HPE Ethernet 10Gb 2-port 562SFP+ Adapter
Virtual Client Networking Notes	1 x vmnic on standard vSwitch for management (1 Gb/s) 4 x vmnic on distributed vSwitch for vMotion and workloads (10 Gb/s)
Virtual Client Storage Notes	Details in Client Notes
Other Hardware	Details in Client Notes
Other Software	VMware ESXi 7.0 U2a, Build 17867351

Security Mitigations

Vulnerability	CVE	Exploit Name	Public Vulnerability Name	Mitigated		
				Server Firmware	ESXi	Guest OS
Spectre	2017-5753	Variant 1	Bounds Check Bypass	N/A	Yes	Yes
Spectre	2017-5715	Variant 2	Branch Target Injection	Yes	Yes	Yes
Meltdown	2017-5754	Variant 3	Rogue Data Cache Load	N/A	Yes	Yes

Spectre-NG	2018-3640	Variant 3a	Rogue System Register Read	Yes	N/A	N/A
Spectre-NG	2018-3639	Variant 4	Speculative Store Bypass	N/A	Yes	Yes
Foreshadow	2018-3615	Variant 5	L1 Terminal Fault - SGX	N/A	N/A	N/A
Foreshadow-NG	2018-3620	Variant 5	L1 Terminal Fault - OS	N/A	N/A	Yes
Foreshadow-NG	2018-3646	Variant 5	L1 Terminal Fault - VMM	N/A	Yes	N/A

Notes for Workload

Template deployed with disk type: Thin

Virtualization Software Notes

- Cluster DRS Automation Level set to Fully Automated
- vSphere DRS Migration Threshold level set to 2
- Logging was disabled for all VMs (default enabled)
- All DS3DB VMs had CPU shares, memory shares, and disk shares set to High (default Normal)
- All DS3Web* VMs had CPU shares set to High (default: Normal)
- All memory reserved for all DS3DB VMs (default 0)
- sched.mem.pin set to TRUE for all DS3DB VMs (Default FALSE)
- sched.mem.lpage.enable1GPage set to TRUE for all DS3DB VMs
- DS3DB0 was configured to not use the third virtual disk before building the rest of the tiles.
- All Standby VMs had CPU shares set to Low (default Normal)
- Logical CPU layout changed for all multi-CPU VMs to 1 socket with multiple cores (default single core per socket)
- CD/DVD and floppy devices were removed from all VMs (default present)
-

Advanced ESXi Settings:

- Cpu.CreditAgePeriod = 1000 (default: 3000)
- Cpu.HTWholeCoreThreshold = 0 (default: 800)
- DataMover.HardwareAcceleratedInit = 0 (default: 1)
- DataMover.HardwareAcceleratedMove = 0 (default: 1)
- Disk.IdleCredit = 64 (default: 32)
- Disk.ReqCallThreshold = 1 (default: 8)
- Irq.BestVcpuRouting = 1 (default: 0)
- Mem.CtlMaxPercent = 0 (default: 65)
- Mem.ShareScanGHz = 0 (default: 4)
- Misc.TimerMaxHardPeriod = 4000 (default: 500000)
- Net.MaxNetifTxQueueLen = 1000 (default: 2000)
- Net.MaxPortRxQueueLen = 160 (default: 80)
- Numa.LTermFairnessInterval = 0 (default: 5)
- Numa.MigImbalanceThreshold = 57 (default: 10)

- Numa.PageMigEnable = 0 (default: 1)
- Numa.PreferHT = 1 (default: 0)
- Numa.RebalancePeriod = 6000 (default: 2000)
- Numa.SwapLoadEnable = 0 (default: 1)
- Numa.SwapLocalityEnable = 0 (default: 1)
- UserVars.HostClientCEIPOptIn = 1 (default: 0)
- VMFS3.HardwareAcceleratedLocking = 0 (default: 1)
- VMkernel.Boot.hyperthreadingMitigation = True (default: False)
- Power.CpuPolicy = High Performance (default: Balanced)

Server Notes

Server BIOS Settings

- HPE Workload Profile set to 'Virtualization' (default: Mission Critical)
- Sub NUMA Clustering set to Enabled (default: Disabled)
- Enhanced Processor Performance set to Enabled (default: Disabled)
- Power Regulator set to Static High Performance Mode (default: OS Control Mode)
- Minimum Processor Idle Power Package C-State set to No Package State (default: Package C6(non-retention) State)
- Energy/Performance Bias set to Maximum Performance (default: Balanced Performance)
- Intel(R) UPI Link Power Management set to Disabled (default: Enabled)
- Energy Efficient Turbo set to Disabled (default: Enabled)
- Uncore Frequency Scaling set to Maximum (default: Auto)
- Processor x2APIC Support set to Force Enabled (default: Auto)
- HW Prefetcher set to Disabled (default: Enabled)
- DCU Stream Prefetcher set to Disabled (default: Enabled)
- DCU IP Prefetcher set to Disabled (default: Enabled)
- LLC Dead Line Allocation set to Disabled (default: Enabled)
- Advanced Memory Protection set to Advanced ECC (default: Adaptive Double Device Data Correction (ADDDC))

Networking Notes

vSwitch Configuration

- standard vSwitch: vSwitch0
  - Uplink: vmnic0 (1Gb/s)
  - vmk0 for management

- distributed vSwitch: DSwitch-VMmark
  - Uplinks: vmnic2,vmnic3,vmnic4,vmnic5 (10 Gb/s)
  - "VM-network" port group for VMs
  - "vMotion" port group for vmk1 and vMotion
  - MTU set to 9000 for distributed vSwitch , vmk1 and all uplinks
  - Client and SUT hosts configured to use the same distributed vSwitch

Storage Notes

OS Storage : VMware ESXi 7.0 U2a was installed on 1 x HPE 1 TB SATA Internal Hard disk for each host.
Primary Storage: Fibre Channel storage

- SanDisk ION Accelerator
- Physical Configuration
    - Storage Box #1
        - Hardware Configuration
            - HPE ProLiant DL380 Gen9
            - 2 x Intel Xeon E5-2660 v4 2.00 GHz processors
            - 256 GB (16x 16 GB 2400 MHz Registered DDR4)
            - 3 x HPE 2.6 TB HH/HL Light endurance (LE) PCIe Workload Accelerator flash cards
            - 2 x HPE SN1000Q dual port 16 Gb fibre HBAs
            - 1 x HPE SmartArray P440ar controller for ION OS
            - 2 x 450 GB 15K RPM SAS SFF for ION OS
            - SanDisk ION Accelerator version 2.5.5

        - Software Configuration
            - A Single storage pool was created using 3 x HPE 2.6 TB HH/HL Light endurance (LE) PCIe Workload Accelerator flash cards
            - All LUNs are RAID0

        - LUN details
            - 1 LUN (900 GB) : Auction* VMs for tile 0 , tile 5
            - 1 LUN (900 GB) : Auction* VMs for tile 10, tile 15
            - 1 LUN (900 GB) : DS3* VMs for tile 0 , tile 5
            - 1 LUN (900 GB) : DS3* VMs for tile 10 , tile 15
            - 1 LUN (500 GB) : Elastic* VMs for tile 0, tile 5
            - 1 LUN (500 GB) : Elastic* VMs for tile 10, tile 15
            - 1 LUN (300 GB) : Standby VMs for tiles 3,8,13,18
            - 1 LUN (100 GB) : Deploy target LUN
            - 1 LUN (100 GB) : template VM
            - 1 LUN (900 GB) : Unused
            - 1 LUN (900 GB) : Unused
            - 1 LUN (500 GB) : Unused

    - Storage Box #2
        - Hardware Configuration
            - HPE ProLiant DL380 Gen9
            - 2 x Intel Xeon E5-2660 v4 2.00 GHz processors
            - 256 GB (16x 16 GB 2400 MHz Registered DDR4)
            - 3 x HPE 2.6 TB HH/HL Light endurance (LE) PCIe Workload Accelerator flash cards
            - 2 x HPE SN1000Q dual port 16 Gb fibre HBAs
            - 1 x HPE SmartArray P440ar controller for ION OS
            - 2 x 450 GB 15K RPM SAS SFF for ION OS
            - SanDisk ION Accelerator version 2.5.5

- Software Configuration
  - A Single storage pool was created using 3 x HPE 2.6 TB HH/HL Light endurance (LE) PCIe Workload Accelerator flash cards
  - All LUNs are RAID0

- LUN details
  - 1 LUN (900 GB) : Auction* VMs for tile 1 , tile 6
  - 1 LUN (900 GB) : Auction* VMs for tile 11, tile 16
  - 1 LUN (900 GB) : DS3* VMs for tile 1 , tile 6
  - 1 LUN (900 GB) : DS3* VMs for tile 11 , tile 16
  - 1 LUN (500 GB) : Elastic* VMs for tile 1, tile 6
  - 1 LUN (500 GB) : Elastic* VMs for tile 11, tile 16
  - 1 LUN (300 GB) : Standby VMs for tiles 2,7,12,17
  - 1 LUN (100 GB) : svMotion target LUN
  - 1 LUN (100 GB) : xvMotion target LUN
  - 1 LUN (900 GB) : Unused
  - 1 LUN (900 GB) : Unused
  - 1 LUN (500 GB) : Unused

- Storage Box #3
  - Hardware Configuration
    - HPE ProLiant DL380 Gen9
    - 2 x Intel Xeon E5-2660 v4 2.00 GHz processors
    - 128 GB (16 x 8 GB 2133 MHz Registered DDR4)
    - 3 x HPE 2.6 TB HH/HL Light endurance (LE) PCIe Workload Accelerator flash cards
    - 2 x HPE SN1000Q dual port 16 Gb fibre HBAs
    - 1 x HPE SmartArray P440ar controller for ION OS
    - 2 x 450 GB 15K RPM SAS SFF for ION OS
    - SanDisk ION Accelerator version 2.5.5

  - Software Configuration
    - A Single storage pool was created using 3 x HPE 2.6 TB HH/HL Light endurance (LE) PCIe Workload Accelerator flash cards
    - All LUNs are RAID0

  - LUN details
    - 1 LUN (900 GB) : Auction* VMs for tile 2 , tile 7
    - 1 LUN (900 GB) : Auction* VMs for tile 12, tile 17
    - 1 LUN (900 GB) : DS3* VMs for tile 2 , tile 7
    - 1 LUN (900 GB) : DS3* VMs for tile 12 , tile 17
    - 1 LUN (500 GB) : Elastic* VMs for tile 2, tile 7
    - 1 LUN (500 GB) : Elastic* VMs for tile 12, tile 17
    - 1 LUN (100 GB) : Unused
    - 1 LUN (100 GB) : Unused
    - 1 LUN (900 GB) : Unused
    - 1 LUN (900 GB) : Unused
    - 1 LUN (500 GB) : Unused

- Storage Box #4
  - Hardware Configuration
    - HPE ProLiant DL380 Gen9
    - 2 x Intel Xeon E5-2660 v4 2.00 GHz processors
    - 128 GB (16x 8 GB 2133 MHz Registered DDR4, running at 1866 MHz)
    - 3 x HPE 2.6 TB HH/HL Light endurance (LE) PCIe Workload Accelerator flash cards
    - 2 x HPE SN1000Q dual port 16 Gb fibre HBAs
    - 1 x HPE SmartArray P440ar controller for ION OS
    - 2 x 450 GB 15K RPM SAS SFF for ION OS
    - SanDisk ION Accelerator version 2.5.5

  - Software Configuration
    - A Single storage pool was created using 3 x HPE 2.6 TB HH/HL Light endurance (LE) PCIe Workload Accelerator flash cards
    - All LUNs are RAID0

  - LUN details
    - 1 LUN (900 GB) : Auction* VMs for tile 3 , tile 8
    - 1 LUN (900 GB) : Auction* VMs for tile 13, tile 18
    - 1 LUN (900 GB) : DS3* VMs for tile 3 , tile 8
    - 1 LUN (900 GB) : DS3* VMs for tile 13 , tile 18
    - 1 LUN (500 GB) : Elastic* VMs for tile 3, tile 8
    - 1 LUN (500 GB) : Elastic* VMs for tile 13, tile 18
    - 1 LUN (300 GB) : Standby VMs for tiles 4,9,14,19
    - 1 LUN (100 GB) : Unused
    - 1 LUN (900 GB) : Unused
    - 1 LUN (900 GB) : Unused
    - 1 LUN (500 GB) : Unused

- Storage Box #5
  - Hardware Configuration
    - HPE ProLiant DL380 Gen9
    - 2 x Intel Xeon E5-2690 v4 2.60 GHz processors
    - 128 GB (16x 8 GB 2133 MHz Registered DDR4, running at 1866 MHz)
    - 3 x HPE 2.6 TB HH/HL Light endurance (LE) PCIe Workload Accelerator flash cards
    - 2 x HPE SN1000Q dual port 16 Gb fibre HBAs
    - 1 x HPE SmartArray P440ar controller for ION OS
    - 2 x 450 GB 15K RPM SAS SFF for ION OS
    - SanDisk ION Accelerator version 2.5.5

  - Software Configuration
    - A Single storage pool was created using 3 x HPE 2.6 TB HH/HL Light endurance (LE) PCIe Workload Accelerator flash cards
    - All LUNs are RAID0

  - LUN details
    - 1 LUN (900 GB) : Auction* VMs for tile 4 , tile 9

- 1 LUN (900 GB) : Auction* VMs for tile 14, tile 19
- 1 LUN (900 GB) : DS3* VMs for tile 4 , tile 9
- 1 LUN (900 GB) : DS3* VMs for tile 14 , tile 19
- 1 LUN (500 GB) : Elastic* VMs for tile 4, tile 9
- 1 LUN (500 GB) : Elastic* VMs for tile 14, tile 19
- 1 LUN (300 GB) : Standby VMs for tiles 0,5,10,15
- 1 LUN (300 GB) : Standby VMs for tiles 1,6,11,16
- 1 LUN (900 GB) : Unused
- 1 LUN (900 GB) : Unused
- 1 LUN (500 GB) : Unused

Datacenter Management Server Notes

VMware vCenter Server Appliance 7.0 U2 Build 17694817 was hosted on a HPE ProLiant DL380 Gen10 that was not part of the client or SUT clusters.

Operating System Notes

SUT hosts used HPE custom image for ESXi 7.0 U2 (VMware-ESXi-7.0.2-17867351-HPE-702.0.0.10.7.0.17-SuperdomeFlex-May2021.iso) for OS installation.

Client hosts used HPE custom image for ESXi 7.0 U2 (VMware-ESXi-7.0.2-17867351-HPE-702.0.0.10.7.0.52-May2021.iso) for OS installation.

Software Notes

None

Client Notes

VMware ESXi 7.0 U2a was installed on RAID 1 volume created from 2 x 600 GB 12G SAS SFF SC HDD

Advanced ESXi Settings

- Power.CpuPolicy = High Performance (default: Balanced)
- UserVars.HostClientCEIPOptIn = 1 (default: 0)

Client BIOS settings

- HPE Workload Profile set to 'Virtualization Max Performance' (default: General Power Efficient Compute)
- Thermal configurations set to 'Maximum Cooling' (default: Optimal Cooling)

The Client VMs were distributed across client hosts as follows:

- Client Host 1: Client0, Client2, Client4, Client6, Client8, Client10, Client12, Client14, Client16, Client18
- Client Host 2: Client1, Client3, Client5, Client7, Client9, Client11, Client13, Client15, Client17, Client19, PrimeClient

The PrimeClient VM had a second virtual disk size of 600 GB (default 200 GB)

Client hosts' network configuration

- Standard vSwitch: vSwitch0
  - Uplink: vmnic0 (1Gb/s)
  - vmk0 for management

- Distributed vSwitch: Dswitch-VMmark
  - Uplinks: vmnic4, vmnic5, vmnic6, vmnic7 (10 Gb/s)
  - "VM-network" port group for VMs
  - "vMotion" port group for vmk1 and vMotion
  - MTU set to 9000 for distributed vSwitch, vmk1 and all uplinks
  - Client and SUT hosts configured to use the same distributed vSwitch

Client Storage

- 8 x 600 GB 12G 15K SFF SAS
  - 2 disks in RAID1 for the ESXi OS boot device
  - 6 disks in RAID5 for local datastore for client VMs

Other Notes

None
